

WHAT IS CLAIMED IS:

1. A coherent light source comprising:
fundamental light having a first wavelength; and
5 a wavelength converting device for converting the wavelength of the
fundamental light by half,
the wavelength converting device converting the fundamental light
into harmonic light having a second wavelength,
wherein the wavelength of the harmonic light is controlled in such a
10 manner that the wavelength of the fundamental light is detected and
controlled to a desired wavelength.
2. The coherent light source according to claim 1, wherein the
fundamental light is emitted from a semiconductor laser having a
15 wavelength-variable function.
3. The coherent light source according to claim 2, wherein the
semiconductor laser comprises an active region, a phase control region and a
distributed Bragg reflection (DBR) region.
20
4. The coherent light source according to claim 3, wherein the desired
wavelength is within a phase-matching wavelength tolerance of the
wavelength converting device, and a variation in wavelength of the
fundamental light with a change in operating current thereof is
25 compensated by changing current to be input to the phase control region or
the DBR region.
5. A coherent light source comprising:
fundamental light having a first wavelength; and
30 a wavelength converting device for converting the wavelength of the
fundamental light by half,
the wavelength converting device converting the fundamental light
into harmonic light having a second wavelength,
wherein a first mechanism that detects the wavelength of the
35 fundamental light and controls it to a desired wavelength and a second
mechanism that controls a phase-matching wavelength of the wavelength
converting device to the wavelength of the fundamental light are provided to

control the wavelength and output of the harmonic light.

6. The coherent light source according to claim 1 or 5, wherein the wavelength of the fundamental light that has passed through the wavelength converting device is detected so as to be controlled to the desired wavelength.

7. The coherent light source according to claim 1 or 5, wherein a means for separating the fundamental light and the harmonic light and detecting only the fundamental light is provided on an optical path through which light generated by wavelength conversion with the wavelength converting device travels.

8. The coherent light source according to claim 1 or 5, further comprising:
a diffraction grating; and
a photo-detector,
wherein the photo-detector detects the fundamental light diffracted by the diffraction grating.

9. The coherent light source according to claim 8, wherein the wavelength converting device has an optical waveguide, and the diffraction grating is formed on the optical waveguide.

10. The coherent light source according to claim 8, wherein the photo-detector detects a position of the fundamental light diffracted by the diffraction grating.

11. The coherent light source according to claim 8, wherein the diffraction grating is formed as a chirped grating whose grating pitch is changed depending on location.

12. The coherent light source according to claim 9, wherein the photo-detector is provided on one side of a substrate on which the optical waveguide is formed.

13. The coherent light source according to claim 1 or 5, further

comprising:

a cesium (Cs) gas cell; and

a photo-detector,

5 wherein the photo-detector detects the fundamental light that has
passed through the Cs gas cell.

14. The coherent light source according to claim 5, wherein the
phase-matching wavelength of the wavelength converting device is varied
by changing a refractive index of the wavelength converting device with
10 electrooptic effect or temperature change.

15. A recording/reproducing apparatus comprising:
the coherent light source according to claim 1 or 5,
wherein the coherent light source is adjusted to have an optimum
15 wavelength that meets the Bragg conditions in reproducing hologram
information recorded on a medium.

16. A recording/reproducing apparatus comprising:
the coherent light source according to claim 1 or 5 and
20 an optical system for focusing light emitted from the coherent light
source on an information medium.